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Conference Abstract

Scaling Up Data Literacy and Computing Skills Training in Biodiversity Science, Lessons Learned from The Carpentries

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Abstract

The expanding availability of access to data about museum specimens, species occurrences, trait data, genetics, and landscapes is revolutionizing biodiversity research. But mobilizing, evaluating, and synthesizing these data to address research questions requires domain-specific computing skills and knowledge.

The Carpentries is a global non-profit organization teaching researchers computational and data science skills for data management and analysis in all domains of research. The Carpentries' teaching practices are based on evidence from the science of learning. Current domain-specific lessons include life, physical, and social sciences. Hands-on exercises build on the existing knowledge of learners, quickly enabling them to apply skills learned to their research. The Carpentries' train-the-trainer model, its globally established community of ~2,000 instructors and its network of regional coordinators have allowed the organization to scale up rapidly, and over 40,000 learners have participated in Carpentries workshops since 2012.

The Carpentries assessment program evaluates the impact of attending a workshop on the participants' perception of their skills and confidence. After attending a Carpentries

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workshop, participants feel more confident in their ability to program and to overcome issues with their analysis. The Carpentries' mentoring program ensures that newly certified instructors receive support and guidance to successfully engage in leading and teaching workshops. Pairing new and experienced instructors, in combination with the development of local communities of instructors, have contributed to the success of The Carpentries workshops.

The Carpentries collaboratively seeks to develop new curricula to address the training needs of the biodiversity data community. Establishing training partnerships between The Carpentries and the various organizations involved in building biodiversity data science skills capacity would increase reach and efficacy. We seek to foster institutional and organizational collaborations that can support the establishment and growth of the infrastructure needed to provide the computational and data literacy skills needed to empower our stakeholders. These include those creating and mobilizing data (e.g., collectors, ecologists, conservationists, curators, collection/data managers), for all scientists, policy-makers, educators, and students who want to use biodiversity data.

Keywords

training, curriculum, community, biodiversity data

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